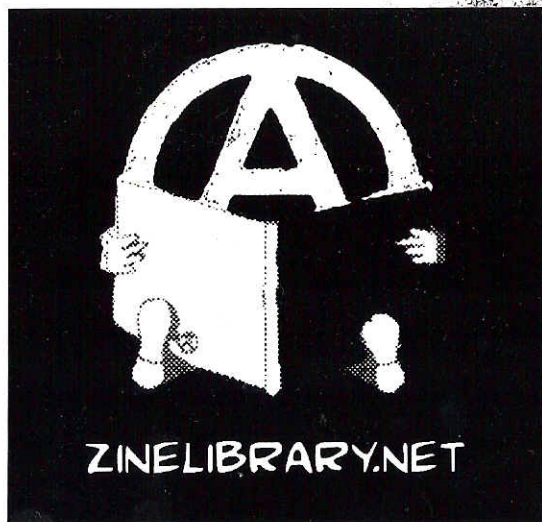


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## *Companion Plants*

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## *What Herbs Can Do for a Garden*

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For the vegetable garden managed according to the Bio-Dynamic method these principles of plant symbiosis have been worked out in detail by Dr. Pfeiffer with dill, sweet marjoram, shallots, summer savory, borage, chives, parsley, tarragon, sage, and other herbs. In various combinations they work together with carefully planned crop rotation, both in time and in space, to allow for root and light competition and individual plant habits, thus making it possible to increase quantity without jeopardizing the health-giving quality of the vegetables we eat.

In short, in this vital matter of the influence of herbs upon our gardens, we know much more than ten years ago, but many secrets are yet to be discovered.

## Companion and Protective Plants

*by Richard B. Gregg*

Over a long period of years people have observed from time to time that certain plants seem to affect favorably or unfavorably certain other plants which may be growing near them. The observers were sometimes peasants or farmers, sometimes gardeners, sometimes scientists such as botanists. The significance of this type of phenomena has been apparently appreciated most clearly by those who were interested in the bio-dynamic methods of farming and gardening. At any rate, they have made the largest assemblage of instances of this sort.

A knowledge of these kinds of relationships between plants means that by planting in accordance therewith one can secure more than the usual control of results. The quality of food and flowers is improved, the losses from insect pests and plant diseases are reduced, the time and money needed to ward off such attacks are lessened, because of the increased vigor of the plants, the risks of losses from drought and frost are made smaller, the money profit and satisfaction and pleasure of work are enhanced. Furthermore, the observation of these relationships stimulates imagination and sensitiveness of observation to other living relationships and thereby opens new doors to further understanding of the world of nature. One can also avoid the failures that result from putting plant opponents near one another.

A large number of instances of such plant relationships are mentioned in Dr. E. Pfeiffer's book, "Bio-Dynamic Farming and Gardening," but there are also a considerable number mentioned in the British "News Sheet of Bio-Dynamic Agriculture," and in other places.

There is now a goodly number of people who could use such information on their farms and gardens and who would like to experiment with it. We have, therefore, tried to compile and arrange it for their benefit. We present it here under the following scheme, hoping that readers will send in other instances they have observed or of which they have been reliably informed.

### Plant Companions

- I. Plants which aid each other directly (other than by enriching the soil or by repelling harmful insects).
  - A. In the garden.
  - B. In field crops.
  - C. In orchard, berry patch, or vineyard.
  - D. In forest.
- II. Plants which aid each other indirectly by enriching the soil.
  - A. In general.
  - B. In forest or wood lot.
  - C. In the vegetable garden.
- III. Plants which oppose or harm each other.
- IV. Instances where a small ratio of a certain plant aids growth of others, though a large ratio hinders or harms.
- V. Plants which repel harmful insects.



- VI. Plants which attract useful insects.
- VII. Plants which repel animal pests.
- VIII. Plants which repel or reduce danger from fungi or other plant diseases.
- IX. Plants which are beneficial to animals.
- X. Plants which attract birds.
- XI. Suggested research and experiments on companion and protective plants.

Let us now name those plants in the groupings above suggested. We will give in most instances only the common names of the plants.

## I. PLANTS WHICH AID EACH OTHER DIRECTLY

### A. In the Garden

- Celery, celeriac and leeks (mutual, 2 rows alternating).
- Celery aids bush beans (1 bean plant to about 6 of celery).
- Carrots with peas (mutual) or leaf lettuce.
- Cucumbers with peas, sweet corn or beans (mutual, if beans are planted around the cucumbers).
- Beets with kohlrabi or onions.
- Beans and sweet corn.
- Tomatoes with asparagus (mutual) or parsley.
- Early potatoes with peas (mutual) sweet corn or beans.
- Potatoes are aided by a small amount of horse radish (the latter in only the four corners of the potato patch), by sainfoin, by dead nettle (*Lamium album*).
- Cabbage is aided by dill, camomile (*Chamomilla officinalis* or *Matricaria chamomilla*), sage, vermouth, rosemary and in both quality and quantity by peppermint (*Mentha piperita*).
- Onions are aided by camomile (*Chamomilla officinalis*), early lettuce (in very good soil) and a few plants of summer savory.
- Garlic and roses (mutual).
- Wild pansies germinate better if grown near rye.
- Tomatoes are aided by stinging nettle. The presence of the latter growing near makes the juice from those tomatoes keep better, retards mold and putrefaction.
- Turnips and peas (mutual).
- Radish is aided by nasturtium, garden cress as border, leaf lettuce (makes radishes tender in summer) and chervil (mutual, plant in alternate rows).
- Strawberries with bush beans, lettuce, spinach, or borage.
- Flax with carrots (double row of carrots and one of flax), or potatoes.
- Corn and pumpkins.
- All vegetables are aided by most aromatic herbs, e.g., borage, lavender, hyssop, sage, parsley, chervil, tarragon, chives, thyme, marjoram, dill, camomile, lovage, wormwood.
- All vegetables are aided by the following in small ratio, as in border: dead nettle, esparcet, valerian, yarrow.
- The aromatic quality of all herbs is increased by the presence of nearby stinging nettle or yarrow.
- Purple foxglove (*digitalis*), lily-of-the-valley, and plants of scilla genus

reason for these benefactions. They are connected with the delicate balances which exist in countless numbers in nature, and which man unwittingly disturbs.

Insect pests are but one sign of these upset balances. Restore the right proportions in nature and the pests gradually recede. This does not mean we shall ever be without insects. In a balanced scheme they are a necessity, but, due to man's interference, their destructive powers occasionally become abnormal. How to restore the right conditions we can learn only by long painstaking observation of nature's own ways. For example, we have found that the white cabbage butterfly so dislikes sage, rosemary, thyme and hyssop that if these herbs are planted among cabbages the butterfly becomes too upset to lay eggs there. Again, apple tree sap is affected by the roots of nasturtiums in such a way that it is distasteful to the woolly aphis. Furthermore, thyme, santolina and southernwood repel moths, as tansy does flies and ants. Because flies avoid the vicinity of walnut trees, cattle enjoy lying there, and man may also have greater comfort with a nut tree on his lawn.

A third aspect of conservation by means of herbs is connected with the influence of one herb upon another, and therefore with the quality of the produce and health of the consumer. In this connection, some 5,000-odd experiments conducted by Dr. Ehrenfried Pfeiffer have been concerned with dynamic effects of substances working only in high dilutions, yet able to transform the entire life cycle of plants. Among plants he traced out many likes and dislikes. Strawberries, for instance, like to grow near spruce trees and are further improved by the addition of a few borage plants in the bed. Lima beans grow unusually well near locust trees. Lacking the trees, one might collect locust leaves for a special compost. Likewise an occasional horseradish plant benefits potatoes; a few chervil plants improve the flavour of radishes; stinging nettle increases the oil content of peppermint, and by hindering the fermentation process in plant juices confers greater keeping qualities on nearby tomatoes; whereas parsley grown nearby improves tomatoes in other ways. Yarrow too has a definite effect on the quality of neighbor plants, increasing not so much their size as their resistance to adverse conditions and consequent health. Coriander seed sown with anise fosters both the germination and growth of the latter. The sage, rosemary, thyme and hyssop disliked by the cabbage butterfly not only keep off this insect, but tend to make the cabbage plants more healthy and digestible.

The cabbage, incidentally, is really a monstrosity among plants, its flowering process being so largely subordinated to the leaf formation that its life cycle is easily upset and it decays quickly. To grow around it such plants, herbs and legumes as have a strong flowering tendency helps prevent the bad results arising from this lack of balance.

On the other hand, some plant combinations are bad. Rue and sweet basil do not thrive near each other. Among the herbs, fennel seems to be of the most doubtful character, the germination of caraway and coriander being hindered by it, bush beans disturbed by it, and tomatoes feeling its blight. Moreover, the temperamental tomato dislikes kohlrabi, and has such an antipathy for quack grass that it kills the intruder right off.



peas, including sweet peas, scarlet runner beans, the edible soy bean, the domestic coffee berry, Chinese salad beans (for sprouts), peanuts, broad beans, and the edible-podded pea. Baptisia, sainfoin and lupines belong here too. Dr. Robert F. Griggs tells us that lupines are the first seedlings to start growth on barren pumice after a volcanic eruption. He went to Alaska for a number of years especially to study re-vegetation in the region of Katmai after its eruption in 1912. In its volcanic ash, almost devoid of nitrogenous compounds and micro-organisms, the lupines were nevertheless always the pioneers. Their roots showed abundant development of nitrogen nodules, and other plants followed close on their heels.

Conversely, members of the buttercup (*Ranunculaceae*) family have a substance in their roots which poisons the soil for clover, being hostile to the growth of nitrogen bacteria. Since this enemy works even in so fine a dilution as 1 to 23,000,000,000, farmers find that clover soon disappears in a meadow where buttercups are increasing. Delphinium, peonies, monkshood and other common garden flowers belong to this family—a family strong and vital, but growing only for itself. After consuming the large amount of fertilizer they crave, these plants leave a sterile humus. Without plenty of good compost, do not expect other plants to grow well in their vicinity.

In contrast, the spurge (*Euphorbiaceae*) family has a way of helping and protecting other tender plants, since, by fostering a soil which preserves warmth, it simulates conditions in a warmer climate. Gray says it is "a vast family in the warmer parts of the world."

It is important to know whether a soil contains or is practically devoid of certain minerals, but even more to the point is the question of whether or not the plants growing on that soil are able to absorb those present. Some plants just take whatever a soil has to offer in large quantities. They are the "luxury consumers," and include many cultivated plants which have been pampered until they have lost their selective powers. Thus their value as food for man and animal becomes more and more one-sided, and they may exert actually harmful effects. Most wild plants, on the other hand—and this includes herbs—have definite mineral requirements, and in spite of poor soil are able somehow to get what they need. The oak, for example, shows a selective absorption for calcium. Oak bark, always rich in calcium, is especially so on sandy soils containing few traces of it. This ability to adapt and survive in spite of (perhaps even because of) adversity accounts for the great vitality of weeds and the high value of many wild plants for medical purposes.

Another way herbs help build and maintain good gardens is by controlling, biologically, both insect pests and plant diseases. Here again prevention is better than cure. Not only individual plants but whole landscapes become diseased through mono-cultural practices, since nature, left to herself, never produces acre after acre of only one kind of plant. Usually the more variation the better, whether in general landscape development, a farm unit or a garden. In medieval horticulture no lines were drawn between the flower, vegetable and herb gardens. All grew together to their mutual benefit. Now, in the plant hormones or acids absorbed from one plant to another we can see a

have a preservative influence on neighboring plants, both vegetables and flowers, after they are harvested or cut.

Summer flowering plants and shrubs in or around a vegetable garden have a generally healthy influence on the vegetables, e.g., wild rose, elderberry, buddleia, privet, golden rod, and bee balm.

Black and white radishes aid other vegetables.

Stinging nettle grown with peppermint nearly doubles its content of aromatic oil.

#### B. In Field Crops

Wheat is aided by camomile (*Chamomilla officinalis*) if in very small ratio (not over 1:100), though harmed by a large amount of camomile.

Corn is aided by cucumber, early potatoes, and beans.

#### C. In Orchard, Berry Patch or Vineyard

Fruit trees and grape vines are aided by intercropping of 15% of mustard with legumes.

Grapes grow especially well on mulberry and elm trees.

Citrus trees like as protective trees the rubber tree, live oak and guava.

#### D. In the Forest

The oak is hospitable to and aids other trees.

## II. PLANTS WHICH AID EACH OTHER INDIRECTLY BY ENRICHING THE SOIL

### A. In General

All legumes add nitrogen to the soil through their root nodules, and thus aid neighboring or subsequently planted vegetation. Examples of such legumes are beans, peas, clover, alfalfa, lespedeza, peanut, kudzu and esparcet.

Flax favorably influences decomposition in the soil and puts the soil structure in excellent friable condition, especially the upper layer.

Buckwheat accumulates calcium, and when composted or plowed under enriches the soil. It also loosens heavy soil.

Caraway loosens heavy soil and puts the ground in good heart.

A compost of the leaves of birch or of black thorn (*Prunus spinosa*) helps exhausted soils.

Henbane accumulates phosphoric acid, and if plowed under or made into compost it should aid the soil in that respect. However, it checks fermentation.

The thorn apple also accumulates phosphoric acid, and its leaves may make a compost especially rich in phosphorus.

Tobacco accumulates potassium; hence, if composted, its stalks and unused leaves should provide enrichment of that element.

Melon leaves are extremely rich in calcium. They may be made into compost good in that respect.

Scotch broom is a legume and also accumulates calcium, and if kept in check it thus aids the soil.

A mulch of pine needles increases the vigor, flavor and stem strength of strawberries.

The nearby presence of birch or elderberry aids in the fermentation of a compost heap.

Rape and soybeans loosen heavy soil and leave it friable.



### B. In Forest or Wood Lot

All the trees and shrubs of leguminous species aid other trees, especially around the edge of the wood lot. Such leguminosae in North America include the Kentucky coffee tree, the honey locust (*Gleditsia triacanthos*), Judas tree (*Cercis canadensis*), yellow wood (*Cladrastis lutea*), woad waxen (*Genista tinctoria*), Scotch broom (*Cytisus scoparius*), locust (*Robinia pseudoacacia*), false indigo (*Amorpha fruticosa*), bristly locust (*Robinia hispida*), pea tree (*Caragana*), and many others.

Humus from leaves of elder bushes aids the soil.

The black alder (*Ilex verticillata*), through the action of its roots, helps to drain wet soil. It also has root nodules which add nitrogen to the soil, being the only nonleguminous shrub which does this. Do not confuse with elder or with the European black alder (*Alnus vulgaris*), which belongs to the birch family.

Earth from the roots of birch trees heals the ground after pine or fir trees or where sick plants have been removed.

Blackberries, nettles, and couch grass, which are strongly vital plants, all aid in the afforestation of unfavorable areas.

### C. In the Vegetable Garden

Rotate rows of the three kinds of crops:

1. *Heavy Feeders* (manure lovers): Includes all of the cabbage family, chard, head lettuce, endive, spinach, celery, leeks, cucumbers, squash, and corn.
2. *Soil Improvers*: Includes all peas and beans.
3. *Neutrals* (compost lovers): Root crops, such as carrots, beets, radishes, salsify, parsnips, onions, etc.

## III. PLANTS WHICH OPPOSE OR HARM EACH OTHER

### A. In the Vegetable Garden

Strawberries dislike cabbage.

Tomatoes are harmed by kohlrabi and fennel.

Bush beans and caraway dislike fennel.

Orach (*Atriplex hostensis*) checks growth of potatoes.

Turnips are harmed by hedge mustard, also by knot weed.

Radish and hyssop dislike each other.

Rue and basil dislike each other.

Chervil planted near radishes makes them taste hot.

Potatoes and sunflowers stunt each other.

The ethylene gas exhaled by dandelions and apples inhibits the length of growth of neighboring plants; also causes flowers and fruits of neighboring plants to mature early.

### B. In Field Crops

Wheat growth is checked by poppies and large proportions of camomile.

Rye checks growths of weeds, e.g., rye planted twice in succession will eliminate quack grass.

Rape is inhibited in growth by hedge mustard and field mustard.

Clover dislikes henbane and buttercups.

### C. In Forest or Orchard

Spruce is aggressive and hostile to all other trees. The adverse effect of

men's observations in China, Mongolia, India, Persia, Siberia, Asia Minor, Afghanistan, the Balkan Peninsula, Finland, the Baltic States, Spain, Greece, Brittany, Ireland, Scotland, Wales, Italy, Sicily, Africa, North, South, and Central America.

## What Herbs Can Do for a Garden

by Evelyn Speiden

The modern world is re-discovering herbs for use in the making of perfumes, condiments, flavorings and medicines, and learning that an herb garden can be a delightful place. But herbs have another importance. By influencing the soil, insects and other plants they can be a vast help to a garden, and so, indirectly, to man. This is the aspect under discussion.

Herbs influence the soil's fertility because the action of their roots goes on constantly. Plant growth involves a life process in which matter is taken up and organized to form the plant body, but there is involved more than a mere addition and subtraction of chemical elements. Within the soil constant infinitesimal changes take place, exchanges between plant and soil through the active forces of light, warmth, moisture, and so forth. About some of these delicate "dynamic" activities scientists are just beginning to learn. Boron, for example, is one of the elements in soil only recently recognized as essential to plant life—though in small amounts only. It enables the plant to regulate its water content by closing certain minute cells which control evaporation. One part in 50,000 is sufficient to make a plant drought-resistant.

Other plants perform their services in different ways. The stinging nettle (*Urtica dioica*), having an affinity for iron, can collect enough of this element to break up and tame a wild soil, its mere presence being usually indicative of a good humus content. Mustard and rape, on the other hand, having somewhat alkaline root secretions, are ideal on a slightly acid or mineralized soil, say, a soil hurt and in need of healing after the overuse of mineral fertilizer. Flax acts as a smoothing harrow on crusty and lumpy clay soils—but never plant it on the same place more than once in five years. Caraway's long roots may be a substitute for subsoiling on heavy, wet land, since it leaves it crumbly; but, being difficult to get started, is best planted with a companion crop of peas. Harvest the peas, harrow as though nothing were there—and the caraway comes up later.

As for clovers, it is well known that most of them die out below a pH of 6.0. They belong to that most interesting of all plant families, the *Leguminosae*, the only one able to "breathe in" the air's precious nitrogen. Every farmer knows well the value of legumes in his crop rotations, but they may be used in many other helpful ways from the trees and shrubs of mixed hedges, windbreaks and mass plantings, down to the smallest garden plants. The proximity of lavender to the legume called Scotch broom, growing naturally on the Mediterranean slopes, may account for the superiority of this lavender—incidentally, in this country, one of the most difficult of herbs to grow; and we might try introducing near it such a fertilizing element. Indeed, all the plants in our gardens benefit by association with beans and



by aphids. See whether they would also protect neighboring plants against aphids.

Test all the effectiveness of the above named insect repelling plants in detail.

In Sicily, the peasants are reported to hang pennyroyal on fig trees to prevent the figs from falling before they are ripe. Test the validity of this report. If it is proved effective, see whether it is also effective on other fruits.

Since pennyroyal is said to repel mosquitoes, plant it on borders of stagnant pools and streams to see if it will decrease the breeding of mosquitoes therein. Its effect might be tested for houses by planting it in window boxes, potted near doorways and on porches for repelling those pests at night.

Experiment to see whether any plants or shrubs repel wood chucks, rabbits, skunks, squirrels, or deer. It is reported that if the manure of rabbits is liquefied and painted on tree trunks, the rabbits will not girdle or injure such trees.

In a book called "In the Herb Garden," by F. A. Bardswell, London, it is reported that the passage of heat rays through the air is hindered by the odor (oil vapor) of mint. The rays seem to be absorbed. Patchouli and cassia have a similar effect. Therefore, peppermint odor seems to cool the air. Test this.

If found true, would this hinder the dissipation of heat from the soil on cool nights and therefore tend to protect neighboring plants from frost? It has been suggested that the odor from a walnut tree has a similar effect.

Duck weed, a water plant, is reported to be radioactive. If true, might this quality prevent mosquitoes from laying eggs nearby?

*Engage in further observation and experiments to learn:*

What other plants influence each other, or influence insects, fungi or animals.

Whether or not in each instance the influence operates on the germination, early growth, flowering, setting or ripening of fruit; development of roots, of stems, or of leaves; longevity, keeping qualities or flavor of fruit or any grouping of these elements.

The effect of varying ratio or relative proportions of numbers of the active and affected plants in each instance.

The possible effect of the relative position of the plants in relation to the sun, earth's pole, or prevailing winds.

In order to suggest directions for further research, see whether in the known instances of specific plant influence, there is any general traceable relationships in respect to (1) botanical classification, (2) mineral content, (3) hormones or vitamins common to each, (4) pH values of roots or of leaves, (5) amount of radio activity of root tips.

Try to determine in each instance whether the influence is exerted by way of gases or odors given out; via excretions from root, leaf, flower; whether as enzymes, catalysts, accumulators of specific minerals or salts, by way of influences of temperature, moisture, or otherwise.

*Here are some suggested sources for possible further information:*

"A Modern Herbal," by Grieve and Lyall (Harcourt, New York); sundry old herbals such as that by Culpepper; books by observant travelers, especially botanists, anthropologists and broad-minded physicians; peasant lore and herds-

spruce may, it is said, be noticed in the soil for 15 years afterward.

Beeches and ferns dislike each other.

#### IV. INSTANCES WHERE A SMALL RATIO OF A CERTAIN PLANT AIDS GROWTH OF OTHERS, THOUGH A LARGE RATIO HINDERS OR HARMS

##### A. In the Vegetable Garden

Camomile (*Chamomilla officinalis*), 1 plant about every 4 yards aids neighboring onions.

Horseradish aids potatoes if it is restricted to only the corners of the potato plot.

All vegetables are aided by a border; that is, a relatively few plants of dead nettle (*Lamium album*).

Esparecet aids most vegetables if planted only in the border of the vegetable plot.

Valerian and yarrow planted in the border only, help most vegetables.

A border of garden cress aids radish.

Bush beans, in ratio of 1 to 6, aid celery.

Beans, as a border around cucumbers, help them.

Cucumbers, as a border around a corn patch, help the corn.

Summer savory, as a border around onions, helps them.

In general, all aromatic herbs except fennel aid all vegetables when in small ratio to the latter, e.g., when planted as a border only or at the end of the row.

##### B. In Field Crops

Camomile, in ratio of 1 to 100, aids in the growth of wheat and produces heavier seeds.

##### C. In the Forest

Black locust (*Robinia pseudoacacia*), in ratio of about 1 to 10, helps a dying forest. Plant it as a border.

The previous section was devoted to plants which affect each other favorably or adversely. This is concerned chiefly with plants which affect insects or animals by way of attraction or repulsion. Some insects and animals aid man, others are harmful or annoying. In dealing with these friendly or noxious creatures, we may use plants to aid us. To proceed with the lists:

#### V. PLANTS WHICH REPEL HARMFUL INSECTS

##### A. Insects Harmful to Garden Plants

Nasturtiums repel squash bugs and wooly aphid on apple trees.

Oak leaf mulch or tan bark repels slugs, cut worms and grubs of June bugs. Spread it on garden paths and in strips in the beds.

Wormwood and mint repel "black fleas."

Sage and mint repel cabbage worm butterfly and thereby protect neighboring cabbage.

Spearmint and julep mint repel ants and may help control aphid since the ants place aphid on the plants.

Pennyroyal and rough tansy are also reported to repel ants.

Wormwood and southernwood repel moths and protect nearby cabbage against cabbage-worm butterfly.



White geranium is said to be a catch plant for Japanese beetles. They are attracted to it, eat it, and are then said to die.

Flax in the rows between potatoes remarkably reduces the number of potato bugs.

If there are sudden hordes of insects, such as grasshoppers, Japanese beetles, potato bugs, etc., and they can be gathered in considerable quantity and burned: their ashes sprinkled over vegetation have a repellent effect.

If soft-bodied insects, such as caterpillars, some grasshoppers, and even slugs, are put into a jar or bottle in some quantities with a tight cover or cork, together with a few tablespoonfuls of water, they die and decompose, creating a solution with a horrible odor. If this is strained and mixed with 50 times as much water (thus making a 2% solution), it makes a solution which, when sprayed on vegetation will repel insects rather effectively. In this high dilution, however, the bad odor is no longer perceptible to human beings.

Potato bugs prefer eggplant to potatoes. A border of eggplants around a potato patch gives a chance to concentrate, catch, and destroy a large portion of the attacking potato bugs.

#### B. Insects Annoying or Harmful to Domestic Animals or Man

Nut trees, especially the walnut, repel stable flies, houseflies, and flies that live on cattle. Nut trees in pastures are, therefore, a great comfort to cattle and horses. Perhaps a decoction of walnut leaves could be sprayed on horses and cattle to keep off flies. Such trees, if near manure piles and entrances to barn and stable, might reduce the number of flies.

Rue (*Ruta*) repels houseflies and stable flies. Grown in window boxes or around manure piles, this herb should help to exclude pests from barns and houses.

The plant of the castor bean repels mosquitoes. Located near porches and piazzas, it should, therefore, increase the comfort of sitting outdoors on hot summer nights.

Rough tansy is said to repel flies and ants.

Ants are repelled by pennyroyal, julep mint and spearmint. If these herbs are scattered around a food pantry, they may prevent infestation by this pest.

Moths that attack woolen clothing and carpets can be repelled by wormwood, southernwood, rosemary, sage, santolina, lavender and mint. These herbs are also effective when dried.

Tomato plants and a spray made of vermox (wormwood) extract repel flies.

Other herbs, including thyme, santolina, winter savory, blessed thistle, both pink and white hyssop, lavender and marjoram, are said to repel certain insects. Experiments are needed to make this information more exact.

#### VI. PLANTS WHICH ATTRACT USEFUL INSECTS

Valerian attracts earthworms. (N.B.: It also attracts cats and dogs.)

Onion tops and chicory roots as compost material attract earthworms to the heap.

Thyme, catnip, lemon balm, pot marjoram, hyssop, sweet basil, summer savory and mint are especially attractive to honey bees.

Summer flowering plants of mixed varieties attract a wide and balanced

variety of insects, thus promoting pollination of all neighboring vegetation.

#### VII. PLANTS WHICH REPEL ANIMAL PESTS

Spurge (*Euphorbia lathyrus*) repels moles and mice.

*Euphorbia lactea* repels mice and rats.

The sea onion (*Scilla maritima*), a desert plant, repels rats.

Leaves of the dwarf elder (*Sambucus ebulus*) will drive mice away from granaries.

Spearmint is reported to repel various rodents.

The vetchling or everlasting pea (*Lathyrus*) repels field mice (the European vole).

#### VIII. PLANTS WHICH REPEL OR REDUCE DANGER FROM FUNGI OR OTHER PLANT DISEASES

The action against fungi might be considered a part of No. III for fungi are a microscopic form of vegetation.

*Equisetum arvense* (the dried leaves and stems of this plant are made into a decoction and sprayed on the plants to be protected; stinging nettle; crows-foot or buttercup (the neighborhood of 2 or 3 living plants is less likely to infection by fungi).

#### IX. PLANTS WHICH, WHEN EATEN, ARE BENEFICIAL MEDICINALLY TO ANIMALS

Tansy and mulberry leaves are curative of worms in horses, perhaps also in cattle.

The sea onion (*Scilla maritima*) is good for colic in cattle.

Ordinary onion, also small quantities of sprouted grains, such as wheat, oats, barley, promote reproductive potency in bulls.

Lemon balm in pastures promotes the flow of milk in cows.

Leaves of hazelnut when eaten by cows increase the butterfat content of their milk. The tannic acid of the leaves also has a cleaning effect on their digestive system.

Carrots are good to cure worms in goats.

Greens of dandelion and young stinging nettle are good preventive and cure of coccidiosis in chickens.

Yarrow hay or tea is good for sheep.

Camomile tea is excellent to cure diarrhea or scours in calves.

A steeped tea made from equal parts of chervil, lemon balm, and camomile, applied in a compress, is excellent for hoofrot of animals. Keep on 20 minutes and then dry off.

#### X. PLANTS WHICH ATTRACT BIRDS

Certain plants by their physical characteristics attract birds for nesting purposes; e.g., honeysuckle vines, thorn bushes, elms, evergreens.

Some plants have attractive seeds or fruits; e.g., hackberry, elderberry, mulberry, wild cherry, dogwood, Japanese barberry, viburnum and others. (See bulletins of U. S. Dept. of Agriculture on promotion of wild life for names of other trees, shrubs and vines of this sort.)

#### XI. SUGGESTED RESEARCH AND EXPERIMENTS ON COMPANION AND PROTECTIVE PLANTS

Phellodendron, begonias and geraniums are reported to be virtually never